1/31/00

PATENT APPLICATION
Docket No.: 34648/00430USPX
P11303US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Andrew Sharp et al.

For: Communication System, Methods of Managing a Communication System and Mobile User Equipment

CERTIFICATE OF MAILING BY EXPRESS MAIL

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Date of Deposit: January 28, 2000
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Type or Print Name: GAIL HUDLER

Signature

BOX PATENT APPLICATION
Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

PATENT APPLICATION TRANSMITTAL LETTER

Transmitted herewith for filing, please find the following:

1. (XX) The specification of the above-referenced patent application is enclosed herewith (65 page(s) including claim(s) and Abstract).

2. (XX) 11 sheet(s) of:
___ informal drawing(s) is (are) enclosed herewith.
X formal drawing(s) is (are) enclosed herewith.

3. ( ) This application is a:
___ Continuation
___ Divisional
___ Continuation-In-Part
of prior copending parent application
Serial No. _____ filed on _____, now pending.
Please amend the application to insert the following line in the beginning of the specification:
--This application is a Continuation of prior application Serial No. _____ filed on _____, now pending.--
In the event that a petition to extend time under 37 CFR 1.136 is necessary in the parent application to maintain copendency for this application, a petition for an extension of the necessary time to maintain copendency is hereby requested for the parent application

and the Commissioner is hereby authorized to debt our Account Number 10-0447 for the necessary fees.

4. (X) The fees for this application have been calculated and included as shown below (Prior to calculating the fees, please enter any enclosed preliminary amendment.):

	NO. FILED	NO. EXTRA	RATE	FEE
BASIC FEE				**$690**
TOTAL CLAIMS	**39-20**	**19**	**$18**	**342**
INDEPENDENT CLAIMS	**3- 3**	**__**	**$78**	**0**
MULTIPLE DEPENDENT CLAIM(S) PRESENTED			**$260**	
TOTAL FEES:				**$1,032.00**
Deduct one-half of fee for Small Entity				
TOTAL AMOUNT DUE:				**$1,032.00**

__X__ A check(s) in the amount of $1,032.00 is enclosed herewith. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-0447.

___ Please charge my Deposit Account No. _____ in the amount of $_____. Please charge any deficiency or credit any overpayment to Deposit Account No. _____.

5. (XX) An oath or declaration is enclosed herewith that is:

__X__ Unsigned

___ Newly executed per 37 CFR 1.63(a) and (b).

___ A copy of the executed declaration filed in the prior application upon which priority is based, showing the signature or an indication thereon that it was signed; and:

___ This application is being filed fewer than all of the inventors named in the prior application and it is requested that the following name or names be deleted from the list of inventors in the prior application for this continuation or divisional application:

_____

_____.

___ The prior application was accorded status under 37 CFR § 1.47 and is accompanied by:

___ A copy of the decision granting a petition to accord Sec. 1.47 status to the prior application

(unless all of the inventors have or legal representatives have filed an oath or declaration to join in the prior application).

___ A copy of the subsequently executed oath(s) or declaration(s) filed by the inventor(s) or legal representative(s) that have subsequently joined in the prior application.

6. (XX) The power of attorney for this application:

___ is appointed in the newly executed Oath or Declaration submitted herewith.

_X_ is appointed by the power of attorney enclosed herewith.

___ remains the same as originally in the parent application.

___ was changed during the prosecution of the parent application and a copy of the change in the power of attorney is enclosed herewith.

7. (XX) The correspondence address for this application shall be:

Richard Moura, Esq.
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3200 Fountain Place
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Dallas, Texas 75202

_X_ which is a new correspondence address or a change therein.

___ which is the same as originally in the parent application.

___ which is the change in the correspondence address that was filed during the prosecution of the parent application.

8. (XX) Priority is hereby claimed under 35 USC 119 and 172 to the following foreign applications:

Country	Serial No.	Date
EPO	99101948.0	01/31/99

and:

_X_ A certified copy of each application is enclosed herewith.

___ A certified copy of each application was filed in prior application Serial No. _____.

9. ( ) A verified statement claiming small entity status under 37 CFR 1.9 and 1.27:

___ is enclosed herewith.

___ was filed in parent application Serial No. _____, and such status remains unchanged and is requested for this application.

10. (XX) A preliminary amendment is enclosed herewith.

11. (XX) An Information Disclosure Statement with Modified PTO Form 1449 and a copy of the cited references are enclosed herewith.

12. ( ) An Assignment of the invention to _____ with cover sheet and recordation fee is enclosed herewith for recordation by the Assignment Branch.

13. (XX) The Commissioner is hereby authorized to charge payment, or to credit any overpayment, of the following fees associated with this filing or during the pendency of this application to Deposit Account No. 10-0447.

X Any patent application filing fees under 37 CFR 1.16.
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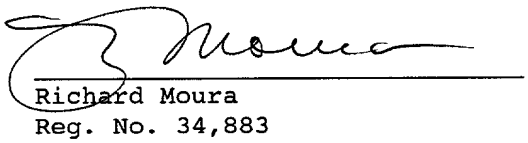
___ The issue fee under 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).

14. ( ) Other (specify):_____
_____
_____.

15. (XX) Confirmation Postcard.

Respectfully submitted,



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Patent Application
Docket No. 34648-430

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Andrew Sharp and
Martin Stümpert

Serial No.: NOT ASSIGNED

Examiner: NOT ASSIGNED

Filed: Herewith

Group Art Unit: NOT ASSIGNED

For: COMMUNICATION SYSTEM, METHODS OF MANAGING A COMMUNICATION SYSTEM AND MOBILE USER EQUIPMENT

BOX PATENT APPLICATION
Assistant Commissioner
for Patents
Washington, D.C. 20231

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Type or Print Name GAIL HUDLER

Signature

Dear Sir:

PRELIMINARY AMENDMENT

Prior to the examination of this application, please amend the above-identified application for patent as follows:

IN THE SPECIFICATION

Page 63, Line 1, replace "Summary:" with --ABSTRACT--.

Page 63, Line 21, delete "Figure 1"

IN THE CLAIMS

Please amend Claims 1-39 as follows:

1. (Amended) A communication system comprising:

[with] at least two different access [systems] networks, wherein a first access [system] network is capable of handling a first number of communications between a mobile user equipment [(MUE)] and the first access [system] network, and wherein a second access [system] network is capable of handling a second number of communications between the mobile user equipment [(MUE)] and the second access [system, characterised in that] network, and wherein at least one of the mobile user equipment [(MUE)and/or] and the communication system [contains] contain at least one means for making at least one decision which communication or communications are handed over in the case that the mobile user equipment [(MUE)] moves between the first access [system] network and the second access [system] network and in that the at least one of the mobile user equipment [(MUE) and/or] and the communication system further contain at least one means for executing the at least one decision.

2. (Amended) The communication system according to claim 1, [characterised in that the communication system contains] further comprising at least one means [(CAE)] for determining a capability of at least one of the access systems.

3. (Amended) The communication system according to claim 2, [characterised in that] wherein the means for determining the capability is located in a core network [(CN)].

4. (Amended) The communication system according to [any of the claims 1 to 3, characterised in that] claim 1, wherein at least one access network [(AN) of the communication system] contains the means for executing the at least one decision.

5. (Amended) The communication system according to [any of the claims 1 to 3, characterised in that] claim 1 , further comprising a core network [(CN)] that contains the means for executing the at least one decision.

6. (Amended) The communication system according to [any of the claims 1 to 3, characterised in that] claim 1, wherein the mobile user equipment [(MUE)] contains the means for executing the at least one decision.

7. (Amended) The communication system according to [any of the claims 1 to 6, characterised in that] claim 1, wherein at least one access network [(AN) of the communication system] contains the means for making at least one decision.

8. (Amended) The communication system according to [any of the claims 1 to 6, characterised in that] claim 1, further comprising at least one core network [(CN)] that contains the means for making at least one decision.

9. (Amended) The communication system according to [any of the claims 1 to 6, characterised in that] claim 1, wherein the mobile user equipment [(MUE)] contains the means for making at least one decision.

10. (Amended) The communication system according to [any of the claims 1 to 9, characterised in that it contains a] claim 1, further comprising means for making at least one decision whether an intersystem handover is necessary.

11. (Amended) The communication system according to [any of the claims 1 to 10, characterised in that] claim 10, wherein the means for making at least one decision whether an intersystem handover is necessary is a device [(DPH)].

12. (Amended) The communication system according to [claim 10 or 11, characterised in that] claim 11, wherein the device [(DPH)] is located in an access network [(AN)].

13. (Amended) The communication system according to [claim 12, characterised in that] claim 11, wherein the device [(DPH)] is located in a radio network controller.

14. (Amended) The communication system according to claim 11, [characterised in that] wherein the device [(DPH)] is located in a core network [(CN)].

15. (Amended) Method for managing a communication system, with at least two different access [systems,] networks, wherein a first access [system] network is capable of handling a first number of communications between a mobile user equipment [(MUE)] and the first access [system] network, and wherein a second access [system] network is capable of handling a second number of communications between the mobile user equipment [(MUE)] and the second access [system, characterised in that it is evaluated] network, said method comprising the steps of:

evaluating if a handover from the first access [system] network to the second access [system] network should be effected[,]; and

[wherein] selecting, in the case that the handover is necessary [it is selected], which communication or communications are handed over.

16. (Amended) The method according to claim 15, [characterised in that] wherein an access network [(AN)] sends a handover query to the mobile user equipment [(MUE)].

17. (Amended) The method according to claim 16, [characterised in that] wherein the access network [(AN)] signals a core network [(CN)], before the access network [(AN)] sends the handover query [(HQ)] to the mobile user equipment [(MUE)].

18. The method according to claim 17, [characterised in that] wherein the core network [(CN)] adds information about a communication or communications which can be supported.

19. (Amended) The method according to [any of the claims 15 to 18, characterised in that it enables] claim 15, further comprising the step of enabling a mobile user to decide [about] whether the communication or the communications [which] should be handed over to the second access [system] network.

20. (Amended) The method according to [any of the claims 15 to 19, characterised in that] claim 15, wherein the mobile user equipment [(MUE)] informs the access network [(AN)] about the communication or the communications which should be handed over to the second access [system] network.

21. (Amended) The method according to [any of the claims 15 to 20, characterised in that] claim 15, wherein the mobile user equipment [(MUE)] receives a handover query [(HOQ)] for handover towards the second access [system] network, then the mobile user equipment [(MUE)] disconnects all connections[,] that cannot be kept in the second access [system] network.

22. (Amended) The method according to [any of the claims 15 to 21, characterised in that] claim 15, wherein the core network [(CN)] decides which communication or communications should be handed over to the second access [system] network.

23. (Amended) The method according to [any of the claims 15 to 22, characterised in that] claim 15, wherein all communications which cannot be kept in the second access [system] network are disconnected.

24. (Amended) The method according to [any of the claims 15 to 23, characterised in that] claim 15, wherein at least one decision about a communications which are handed over in the case that the mobile user equipment [(MUE)] would move between the first access [system] network and the second access [system] network depends on at least one presetting.

25. (Amended) The method according to claim 24, [characterised in that] wherein the presettings are located within a mobile user equipment.

26. (Amended) The method according to claim 25, [characterised in that] wherein the presettings are transferred to the core network within at least one of an initial user equipment [(IUE)] message [and/or] and in a setup [(SU)] message.

27. (Amended) The method according to claim 25, [characterised in that] wherein a message which depends on the presettings is sent to the core network [(CN)] after the core network [(CN)] has sent a request to the mobile user equipment [(MUE)].

28. (Amended) The method according to claim 24, [characterised in that] wherein the presettings are stored within at least one of an access network [(AN) and/or an] and a core network [(CN)].

29. (Amended) The method according to claim 28, [characterised in that] wherein the presettings can be different for each mobile user.

30. (Amended) The method according to claim 28, [characterised in that] wherein the presettings are identical for all users.

31. (Amended) The method according to [any of the claims 24 to 30, characterised in that] claim 24, wherein the presettings can be different for different categories of communications.

32. (Amended) The method according to [any of the claims 24 to 31, characterised in that] claim 24, wherein the presettings can be different for different priorities for different communications.

33. (Amended) The method according to [any of the claims 24 to 32, characterised in that] claim 24, wherein the presettings are defined [and/or] and modified by an operator.

34. (Amended) The method according to [any of the claims 24 to 33, characterised in that] claim 24, wherein the presettings are defined [and/or] and modified by a mobile user.

35. (Amended) The method according to [any of the claims 15 to 34, characterised in that] claim 15, wherein at least one of the communications is put on hold before the handover and kept on hold after the handover.

36. (Amended) The method according to [any of the claims 15 to 35, characterised in that] claim 15, wherein the mobile user equipment [(MUE)] puts the at least one communication on hold.

37. (Amended) The method according to [any of the claims 15 to 35, characterised in that] claim 15, wherein the core network [(CN)] puts the at least one communication on hold.

38. (Amended) [Mobile user equipment, capable of communicating in a communication system, characterised in that it] The method according to claim 15, wherein the mobile user equipment contains an indicator that an intersystem handover is needed.

39. (Amended) Method for managing a communication system, with at least two different access [systems,] networks, wherein a first access [system] network is capable of handling a first number of communications between a mobile user equipment [(MUE)] and the first access [system] network, and wherein a second access [system] network is capable of handling a second number of communications between the mobile user equipment [(MUE)] and the second access [system, characterised in that the method is carried out in a way that at least one of the communications is put on hold before the intersystem handover and kept on hold after the intersystem handover.] network, said method comprising the steps of:

holding at least one of the communications before an intersystem handover; and

keeping said at least one of the communications on hold after the intersystem handover.

REMARKS

Applicants have amended the claims of the foreign patent application (European Patent Application No. 99101948.0 filed January 31, 1999) on which priority is claimed.

In view of the forgoing amendment, the claims now pending in the application are respectfully submitted to be in condition for allowance, and action to that end is respectfully requested.

Respectfully submitted,

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Communication System, Methods of Managing a Communication System and mobile user equipment

Description

Field of the Invention:

The present invention relates to a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system, and wherein a second access system is capable of handling a second number of communications between the mobile user equipment and the second access system.

The invention further relates to methods for managing a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system, and wherein a second access system is capable of handling a second number of communications between the mobile user equipment and the second access system.

The invention further relates to a mobile user equipment capable of communicating in a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system, and wherein a second access system is capable of handling a second number of communications between the mobile user

equipment and the second access system.

Communication systems such as cellular and/or satellite based telephone systems have developed significantly in operations world-wide.

An important example of a communication system with a first access system and a second access system is an implementation of so-called „islands" of a new access system within an already existing access system. However, the invention is not limited to implementations of a new access system within an already existing access system, but applies to any communication system with at least two different access systems. The invention also refers to a communication system that is equipped differently within different service areas, for example giving users within cities a higher service quality than in rural regions.

Future communication systems will allow mobile user equipments to perform a greater number of communications simultaneously. Examples of the communication include telephone calls, faxes, downloading of data or uploading of data (file transfer). However, the invention is not limited to these examples. According to the invention, communication is not limited to any special form of transfer, neither to information transfer with establishing a connection nor to connectionless information transfer. According to the invention, communication includes connections as well as connectionless transfer of information such as Short Messaging Service (SMS). Future wireless scenarios for wideband wireless multimedia services can comprise: interactive news delivery (voice, video, E-mail, graphics), interactive e-mail (text, graphics,

video clips), interactive audio (CD-quality voice, video, graphics), video conferencing, web browsing, dynamic Internet-based games, downloading large files from intranets or position/location-dependent "push" info.

An object of the invention is to create a communication system with a first access system and a second access system, wherein at least one of the access systems allows the mobile user equipment to perform more than one communication, wherein a intersystem handover of communication between the first access system and the second access system is possible.

A shortcoming of the known system is that an intersystem handover between the first access system and the second access system is not possible.

This problem is solved advantageously by the system of claim 1, the method of claim 15, the mobile user equipment of claim 38 and the method of claim 39.

A further object of the invention is a method for managing a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment and the second access system. The method is carried out in a way that it is evaluated if a intersystem handover from the first access system to the second access system should be effected and if the intersystem handover is necessary maximally the second number of communications are handed over.

A further object of the invention is a method for managing a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment and the second access system. The method is carried out in a way that at least one of the communications is put on hold before the intersystem handover and kept on hold after the intersystem handover.

A further object of the invention is to provide a mobile user equipment, capable of communicating in a communication system with at least two different access systems. According to the invention, the mobile user equipment contains an indicator to indicate an intersystem handover to a mobile user.

Further advantageous embodiments and implementations are achieved according to the claims 2 to 14 and 16 to 37.

The invention makes use of the idea to distinguish between different communications and/or different types of communication. Thus the invention allows the communication system and/or the mobile user equipment to handover different communications and/or different types of communication in a different manner.

According to the invention, the problem is solved by a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment and the first access system and wherein a second

access system is capable of handling a second number of communications between the mobile user equipment and the second access system. This is characterised in that the mobile user equipment and/or the communication system contains at least one means for making at least one decision which is capable of deciding which communications are handed over in the case that the mobile user equipment moves between the first access system and the second access system and in that the mobile user equipment and/or the communication system contain at least one means for executing the at least one decision.

The communication system allows mobile user equipments to communicate. A communication system consists at least of at least one access system. An access system consists of at least one access network and at least one core network. An access network consists at least of entities that manage the resources of the access network and provide the user with at least one mechamism to access the core network.
A core network consists at least of entities that provide support for the network features and telecommunication services. The support provided may include for example functionality such as the management of user location information, the control of network features and services, the transfer mechanisms for signalling and for user generated information.

An intersystem handover is a handover between a first and a second access system, or a handover within a first access system, in both cases between means with different capabilities.

As the invention is not limited to communication systems with

UMTS and/or GSM as access systems, neither the access network nor the core network are limited to elements of UMTS implementations or GSM implementations. Each of the access systems may comprise at least one access network and at least one core network. As the invention relates to access systems with different capabilities of handling simultaneous communications, no special structure of the networks is required. Therefore the access network may be any installation, which is capable of giving mobile user equipments a capability of transferring information. The core network could be any installation, which is capable of transferring information to and/or from other communication systems, for example, a fixed network such as an Integrated Service Digital Network (ISDN), a Public Switched Telephone Network (PSTN) or a further mobile network.

As the invention relates to a large variety of communication systems, the nature and occasion of the means for making at least one decision which communication or communications are handed over in the case that the mobile user equipment would move between the first access system and the second access system, may vary too.

The means for making at least one decision may decide on the number and/or the identity of a communication or communications to be handed over. This includes also the case that no communication is handed over, for example when a mobile user decides not to continue a route in order to avoid a intersystem handover.

The mobile user equipment is capable of handing over at least one communication from the first access system to the second access system. Each of the access systems is capable of

handling a certain number of communications for each of the mobile user equipments. A limitation of the number of communications originates for example in technical constraints as found in the conventional GSM system, which is capable of handling only one communication for the mobile user equipment. However, even systems which would principally allow a higher number of simultaneous communications for each of the mobile user equipments could be limited permanently or temporarily to a certain number of communications for each of the mobile user equipments.

Whereas an intersystem handover between an access system, that allows a lower number of simultaneous communications to an access system, which allows a higher number of simultaneous communications does not evoke problems, the intersystem handover in opposite directions is difficult.

The invention allows a management of different communications of a mobile user equipment which passes from a first access system with at least two, preferably more simultaneous communications to another access system allowing a lower number of simultaneous communications for each of the mobile user equipments.

The first access system comprises for example a Universal Mobile Telecommunication System (UMTS) and the second access system is a Global System for Mobile Telecommunication (GSM), or an Universal Mobile Telecommunication System (UMTS) which allows a lower number of simultaneous communications than the first access system.

The mobile user equipment is, for example, a mobile computer capable of communicating, a mobile telephone or a mobile

multimedia system.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the communication system contains at least one means for determining a capability of at least one of the access systems.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the means for determining the capability is located in a core network.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, at least one access network of the communication system contains the means for executing the at least one decision.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, a core network contains the means for executing the at least one decision.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the mobile user equipment contains the means for executing the at least one decision.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, at least one access network of the communication system contains the means for making at least one decision.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, a core network contains the means for making at least one decision.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the mobile user equipment contains the means for making at least one decision.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the communication system contains a means for making at least one decision whether an intersystem handover is necessary.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the means for making at least one decision whether an intersystem handover is necessary is a device (DPH).

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the device (DPH) is located in an access network (AN).

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the device is located in a radio network controller.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the device is located in a core network (CN).

In an advantegous implementation of the communication system, the methods, and the mobile user equipment, a Base Station Controller (BSC) and one or more Base Transceiver Stations (BTS) constitute an access network of the communication system. Within an implementation of a Global System for Mobile Communication (GSM) every mobile user equipment is linked to

one Base Transceiver Station (BTS). In other access systems like implementations of a Universal Mobile Telecommunication System (UMTS) each of the mobile user equipments may be in a contact with more than one Base Transceiver Station (BTS).

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, it is evaluated if an intersystem handover from the first access system to the second access system should be effected, wherein in the case that the intersystem handover is necessary at least one communication can be handed over.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, an access network sends an intersystem handover query to the mobile user equipment.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the access network signals a core network before the access network sends the intersystem handover query to the mobile user equipment.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the core network adds information about a communication or communications that can be supported.

This information is based on a capability of at least one of the access systems, especially the capability of the access system to which the communication or communications are handed over.

In an advantageous implementation of the communication system,

the methods, and the mobile user equipment, a mobile user decides about the communication or the communications which should be handed over to the second access system.

This decision can be taken at any suitable time, for example, in a setup message of the communication or after a signal that an intersystem handover is necessary.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the mobile user equipment informs the access network about the communication or the communications which should be handed over to the second access system.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the mobile user equipment informs the access network about the communication or the communications which should be handed over to the second access system at a communication setup.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the mobile user equipment receives an intersystem handover query for intersystem handover towards the second access system and afterwards the mobile user equipment disconnects all connections, that cannot be kept in the second access system.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the core network decides which communication or communications should be handed over to the second access system.

The decision which communication or communications should be

handed over to the second access system includes the case that no communication is handed over. An intersystem handover can be rejected by the access system, the mobile user equipment or the mobile user. The mobile user, for example, may decide to remain within a service area which is covered by the first access system.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the mobile user equipment contains an information interface, for example an indicator either visual,audio and/or tactile example given a blinking light, to inform the mobile user about a potential intersystem handover. Therefore the mobile user can avoid an intersystem handover by stopping a movement out of the service area which is covered by the first access system.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment,
the core network disconnects all calls which cannot be kept in the second access system.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, at least one decision about a communication or communications which are handed over in the case that the mobile user equipment (MUE) would move between the first access system and the second access system depends on at least one presetting.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the presettings are located within a mobile user equipment.

In an advantageous implementation of the communication system,

the methods, and the mobile user equipment, the presettings are transferred to the core network within an initial user equipment (IUE) message and/or in a setup message.

An initial user equipment (IUE) message is a message sent, before and independent of a setup message, containing at least information about presettings for an intersystem handover.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, a message which depends on the presettings is sent to the core network after the core network has sent a request to the mobile user equipment.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the message depends only on the presettings.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the message depends also on an active decision of a mobile user.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the presettings are stored within an access network and/or an core network.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the presettings can be different for different mobile users.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the presettings

are identical for all users.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the presettings can be different for different categories of communications. Examples for different categories of communications are speech or data calls.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the presettings can be different for different priorities.

An example for a priority call is emergency calls.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the presettings are defined and/or modified by an operator.

In an advantageous implementation of the communication system, the methods, and the mobile user equipment, the presettings are defined and/or modified by a mobile user.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, at least one of the communications is put on hold before the intersystem handover and kept on hold after the intersystem handover.

The invention also solves the problem to hand over multi-party calls. If one or more communication is put on hold, it is possible to reactivate the communication at a later time. However, the method of putting at least one communication on hold before the intersystem handover, to keep it on hold after

the intersystem handover and to reactivate the communication at a later moment also applies to other communications as data communications. For example, if a mobile user equipment with an activated speech call and an activated down load of a file moves towards an access system which allows only one simultaneous communication, the data communication is put on hold and reactivated later, especially after the mobile user equipment has finished the speech call or has once again moved towards a third access system which allows more than one simultaneous communication.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, the mobile user equipment (MUE) puts the communication on hold.

In a further advantageous implementation of the communication system, the methods, and the mobile user equipment, the core network (CN) puts the communication on hold.

In a preferred embodiment of the communication system, the methods, and the mobile user equipment, a mobile user is informed before the intersystem handover. This allows a decision of the mobile user about a communication or communications he would like to maintain.

In the following the invention will be further described by means of examples and by means of the figures.

Fig. 1 shows sequences for a first implementation of an intersystem handover procedure according to the invention.

Fig. 2 shows sequences for a second implementation of an

intersystem handover procedure according to the invention.

Fig. 3 shows sequences for a third implementation of an intersystem handover procedure according to the invention.

Fig. 4 shows sequences for a fourth implementation of an intersystem handover procedure according to the invention.

Fig. 5 shows sequences for a fifth implementation of an intersystem handover procedure according to the invention.

Fig. 6 shows sequences for a sixth implementation of an intersystem handover procedure according to the invention.

Fig. 7 shows sequences for a seventh implementation of an intersystem handover procedure according to the invention.

Fig. 8 shows sequences for an eighth implementation of an intersystem handover procedure according to the invention.

Fig. 9 shows sequences for a ninth implementation of an intersystem handover procedure according to the invention.

Fig. 10 shows sequences for a tenth implementation of an intersystem handover procedure according to the invention.

Fig. 11 shows sequences for an eleventh implementation of an intersystem handover procedure according to the invention.

According to figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 the present invention is described in conjunction with an intersystem handover from a Universal Mobile Telecommunication System (UMTS) as a first access system and a Global System for a Mobile Communication System (GSM). However, the examples are not limited to an intersystem handover from a Universal Mobile Telecommunication System (UMTS) to a Global System for Mobile Communication (GSM) but include all types of handover between an access system with a high number of simultaneous communications to an access system with a lower number of simultaneous communications. The different number of simultaneous communications could have technical or non-technical reasons, for example different operators of the access systems. For simplicity the second core network belonging to the second access system is omitted from the figures.

Means for making at least one decision which are capable of deciding which communication or communications are handed over in the case that a mobile user equipment MUE would move between the first access system and the second access system are afterwards described by an logical element LE. Means for executing the at least one decision are afterwards described by examples of execution elements EE. The elements may be

realised physically or virtually.

The sequences according to the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11 are only a part of signal transfer processes.

To achieve an efficient intersystem handover from UMTS to GSM different solutions to decide whether the intersystem handover is necessary may be implemented. Each of them could be combined with each of the sequences according to the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11.

It is preferred, that at least one message includes a measurement control MCT. A measurement control MCT is carried out most advantageously in one of the following manners: An access network AN commands a mobile user equipment MUE to perform measurements. The type of measurements may be adapted to physical parameters of the access systems. Examples of the measurements are:

Radio link measurements. In this case measurements are performed on down link radio links in an active set.

Intra-frequency measurements. In this case measurements on down link physical channels that do not belong to the active set but have the same frequency as the active set are performed.

Inter-frequency measurements. In this case measurements on down link physical channels with frequencies that differ from the frequency of the active set are performed.

Inter-system measurements. In this case measurements on down link physical channels belonging to another radio access

system than the access network AN are performed.

Traffic volume measurements. In this case measurements on up link traffic volume are performed.

Afterwards the mobile user equipment MUE gives a measurement report to the access network AN.

Fig. 1 shows a first advantageous implementation of the invention.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system,.

Actual propositions for standards include at least one setup message for each communication. If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

Permanently or after certain time intervals the number of active radio links between a mobile user equipment and an access network is checked. If this number is low, especially if only one link is found, measurements are performed.

Preferably, it is evaluated how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system, an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, decides, whether an intersystem handover should be effected. By this a

decision that a handover is needed is carried out earlier.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary and a logical element LE for deciding which communication or communications are to be handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that a intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains an execution element EE for executing the intersystem handover.

The core network CN sends a message HRE to a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requests a handover. The signal is one step according to the sequence-diagram represented in fig. 1.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for

example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connections to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

Fig. 2 shows a second advantageous implementation of the invention.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether a intersystem handover is necessary.

If the device DPH decides, that a intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that a intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains a logical element LE for deciding which communication or communications are handed over and an execution element EE for executing the intersystem handover.

The core network CN sends a message HRE to a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requests a handover.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile

Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connections to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

Fig. 3 shows a third advantageous implementation of the invention.

This implementation makes use of the concept, that a mobile user equipment MUE sends to a core network CN of a communication system Initial User Equipment message IUE with information about calls to keep. The information could be - depending on a service value of the communication system - a preference or a definitive order to hand over certain calls.

In this preferred implementation, the information IUE about calls to keep is sent before the communications are established. However, sending the information about calls to keep later, is also possible in the setup message.

After the information IUE about calls to keep has been sent from the mobile user equipment MUE to the core network CN of the communication system, the core network CN could send an acknowledge signal ACK to the mobile user equipment MUE. However, this is in no way necessary.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether a intersystem handover is necessary.

If the device DPH decides, that a intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that a intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains a logical element and an execution element EE for executing the intersystem handover.

The core network CN informs a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requires an intersystem handover.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between the mobile user equipment MUE and the first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connections to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

Fig. 4 shows a fourth advantageous implementation of the invention.

The communication is set up between a mobile user equipment

MUE and a first access system of a communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether a intersystem handover is necessary.

The mobile user equipment MUE contains a logical element LE, which is which is capable of deciding which communications are handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

A handover query HQ is signalled from the access network AN to the mobile user equipment MUE to ask the mobile user equipment MUE which communication or communications are to be saved. Afterwards the mobile user equipment sends a handover response HRP to the access network AN. The access network AN informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN informs a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requires a intersystem handover by sending a handover request signal HRE to the base station controller BSC.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards an intersystem handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user

equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connection to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

Fig. 5 shows a fifth advantageous implementation of the invention.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Terrestrial Radio Access Network UTRAN of an Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary.

The mobile user equipment MUE contains a logical element LE, which is which is capable of deciding which communication or communications are handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN sends a capability request CRQ to the core network CN. The core network CN contains a capability analysis element CAE, which performs measurements and/or calculation about capabilities in the network. Thus, the capability analysis element CAE is a means for determing a capability of the network.

A content of a capability answer CA, which is afterwards sent to the access network AN depends on a capability which the capability analysis element CAE has notified as available.

A handover query HQ is signalled from the access network AN to the mobile user equipment MUE to ask the mobile user equipment MUE which communications are to be saved. Afterwards the mobile user equipment sends a handover response HRP to the access network AN. The access network AN informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN informs a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requires an intersystem handover by sending a handover request signal HRE to the base station controller BSC.

Afterwards the base station controller BSC sends a message for

handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal

RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connection to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

According to fig. 6 an alternative solution is described in which a mobile user equipment contains a logical element LE and an execution element EE.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the

number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary.

The mobile user equipment MUE contains a logical element LE, which is capable of deciding which communication or communications are handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN may send a capability request CRQ to the core network CN. The core network CN contains a capability analysis element CAE, which performs measurements and/or calculation about capabilities in the network. Thus, the capability analysis element CAE is a means for determing a capability of the network.

A content of a capability answer CA, which is afterwards sent to the access network AN depends on a capability which the

capability analysis element CAE has notified as available.

The capability analysis element CAE as well as the capability request CRQ and the capability answer CA are advantageous but not necessary.

A handover query HQ is signalled from the access network AN to the mobile user equipment MUE. Afterwards the mobile user equipment sends a handover response HRP to the access network AN.

A mobile user decides to remain within the first access system after he has been informed that at least one of the communications of the mobile user equipment MUE would be interrupted in the case of a handover. Access network is informed about this with a handover response message HRP.

A preferred embodiment of the invention which is described according to fig. 7 includes a logical element LE within a mobile user equipment MUE. The logical element LE is capable of deciding which communication or communications are handed over in the case that the mobile user equipment MUE would move between a first access system and a second access system.

The communication is set up between the mobile user equipment MUE and the first access system of the communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

As a part of the setup message SU the mobile user equipment MUE informs the access network AN about a communication or communications that should be handed over.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains an execution element EE for executing the handover.

The core network CN informs a base station controller BSC of a second access system, especially a Global System for Mobile Communication GSM, that it requires an intersystem handover by sending a handover request signal HRE to the base station controller BSC.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete signal HCP to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m

communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connection to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete signal CCP to the core network.

In the preferred embodiments of the invention which are described according to fig. 8 a mobile user equipment MUE contains a logic element LE as well as an execution element EE for executing handover.

The communication is set up between the mobile user equipment MUE and a first access system, especially a Universal Mobile Telecommunication System UMTS, of the communication system,.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

As a part of the setup message SU the mobile user equipment MUE informs the access network AN about a communication or communications that should be handed over.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a

Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary and a logical element LE for deciding which communication or communications are handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

An access network AN of the first access system sends a handover query HQ to a mobile user equipment MUE.

Afterwards the mobile user equipment sends a handover response HRP to the access network AN. The mobile user equipment MUE disconnects those communication or communications that cannot be kept. The mobile user equipment informs the core network CN which communication or communications should be kept. The access network informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN informs a base station controller BSC of the second access system, especially a Global System for

Mobile Communication GSM, that it requires an intersystem handover by sending a handover request signal HRE to the base station controller BSC.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and

a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connection to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN sends afterwards a clear complete signal CCP to the core network.

Fig. 9 shows an advantageous implementation of the invention.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

Actual propositions for standards include at least one setup message for each communication. If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

Permanently or after certain time intervals the number of active links is checked. If this number is low, especially if only one link is found, measurements are performed.

Preferably, it is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, decides, whether an intersystem handovershould be effected. By this decision that a handover is needed is carried out earlier.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary and a logical element LE for deciding which communication or communications are to be handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains an execution element EE for executing the handover.

The mobile user equipment contains means for keeping at least one call on hold. Preferably the means is a hold execution element HE.

The core network CN sends a hold order HO to the mobile user equipment MUE. The hold execution element HE puts the requested call on hold and sends a message for hold acceptance HOA to the core network. The sending of the hold order HO and the hold acceptance HOA in the mentioned directions is not part of any GSM standard. However, it is advangeous to inform the mobile user equipment about a communication or communications that are on hold.

With this implementation it is possible, to handover conference calls and/or to keep one ore more communications on hold with the possibility of reactivating them at a later time.

The core network CN sends a message HRE to a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requests a handover. The signal is one step according to the sequence-diagram.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the

core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connections to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

Fig. 10 shows an advantageous implementation of the invention.

The communication is set up between a mobile user equipment MUE and a first access system of a communication system.

Actual propositions for standards include at least one setup message for each communication. If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

Permanently or after certain time intervals the number of active links is checked. If this number is low, especially if only one link is found, measurements are performed.

Preferably, it is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is

connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, decides, whether an intersystem handovershould be effected. By this decision that a handover is needed is carried out earlier.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary and a logical element LE for deciding which communication or communications are to be handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

The access network AN informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The core network CN contains an execution element EE for executing the handover.

The core network CN sends a message HRE to a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requests a handover. The signal is one step according to the sequence-

diagram.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The mobile user equipment contains means for keeping at least one call on hold. Preferably the means is a hold execution element HE.

The core network CN sends a hold order HO to the mobile user equipment MUE. The hold execution element HE puts the requested call on hold and sends a message for hold acceptance

HOA to the core network. The sending of the hold order HO and the hold acceptance HOA in the mentioned directions is not part of any GSM standard. However, it is advangeous to inform the mobile user equipment about a communication or communications that are on hold.

With this implementation it is possible, to handover conference calls and/or to keep one ore more communications on hold with the possibility of reactivating them at a later time.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications, including both active and held communications, is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connections to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN signals afterwards a clear complete CCP signal to the core network.

In the preferred embodiments of the invention which are described according to fig. 11 a mobile user equipment MUE contains a logic element LE as well as an execution element EE for executing handover.

The communication is set up between the mobile user equipment MUE and a first access system, especially a Universal Mobile Telecommunication System UMTS, of the communication system.

If a first number n of communications is established, n setup messages SU are transmitted. However, to facilitate the understanding of the figure, the setup messages SU are represented by one arrow. Effectively, the setup message SU is repeated n times.

As a part of the setup message SU the mobile user equipment MUE informs the access network AN about a communication or communications that should be handed over.

It is evaluated with how many base stations of the first access system the mobile user equipment has contact. If the number is low, especially if the mobile user equipment is connected to only one base station of the first access system an access network AN of the first access system, especially a Universal Mobile Telecommunication System UMTS, commands the mobile user equipment MUE to perform measurements.

The type of measurements is adapted to physical parameters of the access systems. Examples of the measurements are: radio link measurements, intra-frequency measurements, Inter-frequency measurements, or traffic volume measurements.

A measurement report MRT is sent from the mobile user equipment MUE to the access network AN.

The access network AN contains a device DPH, capable of deciding, whether an intersystem handover is necessary and a logical element LE for deciding which communication or communications are handed over.

If the device DPH decides, that an intersystem handover is necessary, the procedure continues as described below.

An access network AN of the first access system sends a handover query HQ to a mobile user equipment MUE.

Afterwards the mobile user equipment sends a handover response HRP to the access network AN. The access network informs a core network CN that an intersystem handover is required by at least one handover request signal HRQ.

The mobile user equipment contains means for keeping at least one call on hold. Preferably the means is a hold execution element HE.

The mobile user equipment MUE sends a hold order HO to the core network CN. The hold execution element HE puts the requested call on hold and sends a message for hold acceptance HOA to the mobile user equipment MUE.

With this implementation it is possible, to handover conference calls and/or to keep one ore more communications on hold with the possibility of reactivating them at a later time.

The core network CN informs a base station controller BSC of the second access system, especially a Global System for Mobile Communication GSM, that it requires an intersystem handover by sending a handover request signal HRE to the base station controller BSC.

Afterwards the base station controller BSC sends a message for handover request acceptance HREA to the core network CN, for example to indicate that the resources for the requested communication or communications are available.

Within the first access system, especially a Universal Mobile Telecommunication System UMTS, a handover command HCM is sent to the access network AN of the first access system.

The access network AN transmits afterwards the handover command HCM to the mobile user equipment MUE. The mobile user equipment MUE sends a handover access HAC to the base station controller BSC.

The base station controller BSC sends afterwards a handover detect signal HDT to the core network CN.

After completing the intersystem handover the mobile user equipment MUE sends a handover complete HCP signal to the base station controller BSC.

The base station controller BSC sends the handover complete signal HCP to the core network CN.

The communication is released before a communication between a mobile user equipment MUE and a first access system of a communication system is disconnected.

If a first number n of communications has been established and a second, lower number m of communications is handed over, n-m communications have to be released.

For each communication which is not handed over a disconnect order DC, a release command RCM and a release complete signal RCP are sent. The disconnect order DC is sent from the core network CN to the mobile user equipment MUE. The mobile user equipment sends afterwards the release command RCM to the core network CN. The release complete signal RCP is sent from the core network CN to the mobile user equipment MUE.

Effectively, the release command RCM and the release complete signal RCP are repeated n-m times to release n-m communications. However, to facilitate the understanding of the figure, the release command RCM and the release complete signal RCP messages are represented by two arrows.

To clear the signalling connection to the first access network, the core network CN sends a clear command CCM to the access network AN. The access network AN sends afterwards a clear complete signal CCP to the core network.

A disconnect, a release or a release complete message need not to be sent just after the handover complete message. However, this has the advantage that the resources in the core network are released earlier.

Claims

1. A communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment (MUE) and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment (MUE) and the second access system, characterised in that the mobile user equipment (MUE) and/or the communication system contains at least one means for making at least one decision which communication or communications are handed over in the case that the mobile user equipment (MUE) moves between the first access system and the second access system and in that the mobile user equipment (MUE) and/or the communication system contain at least one means for executing the at least one decision.

2. The communication system according to claim 1, characterised in that the communication system contains at least one means (CAE) for determining a capability of at least one of the access systems.

3. The communication system according to claim 2, characterised in that the means for determining the capability is located in a core network (CN).

4. The communication system according to any of the claims 1 to 3, characterised in that at least one access network (AN) of the communication system contains the means for executing the at least one decision.

5. The communication system according to any of the claims 1 to 3, characterised in that a core network (CN) contains the means for executing the at least one decision.

6. The communication system according to any of the claims 1 to 3, characterised in that the mobile user equipment (MUE) contains the means for executing the at least one decision.

7. The communication system according to any of the claims 1 to 6, characterised in that at least one access network (AN) of the communication system contains the means for making at least one decision.

8. The communication system according to any of the claims 1 to 6, characterised in that at least one core network (CN) contains the means for making at least one decision.

9. The communication system according to any of the claims 1 to 6, characterised in that the mobile user equipment (MUE) contains the means for making at least one decision.

10. The communication system according to any of the claims 1 to 9, characterised in that it contains a means for making at least one decision whether an intersystem handover is necessary.

11. The communication system according to any of the claims 1 to 10, characterised in that the means for making at least one decision whether an intersystem handover is necessary is a device (DPH).

12. The communication system according to claim 10 or 11, characterised in that the device (DPH) is located in an access network (AN).

13. The communication system according to claim 12, characterised in that the device (DPH) is located in a radio network controller.

14. The communication system according to claim 11, characterised in that the device (DPH) is located in a core network (CN).

15. Method for managing a communication system, with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment (MUE) and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment (MUE) and the second access system,
characterised in that it is evaluated if a handover from the first access system to the second access system should be effected, wherein in the case that the handover is necessary it is selected which communication or communications are handed over.

16. The method according to claim 15, characterised in that an access network (AN) sends a handover query to the mobile user equipment (MUE).

17. The method according to claim 16, characterised in that the access network (AN) signals a core network (CN), before the access network (AN) sends the handover query (HQ) to the mobile user equipment (MUE).

18. The method according to claim 17, characterised in that the core network (CN) adds information about a communication or communications which can be supported.

19. The method according to any of the claims 15 to 18, characterised in that it enables a mobile user to decide about the communication or the communications which should be handed over to the second access system.

20. The method according to any of the claims 15 to 19, characterised in that the mobile user equipment (MUE) informs the access network (AN) about the communication or the communications which should be handed over to the second access system.

21. The method according to any of the claims 15 to 20, characterised in that the mobile user equipment (MUE) receives a handover query (HOQ) for handover towards the second access system, then the mobile user equipment (MUE) disconnects all connections, that cannot be kept in the second access system.

22. The method according to any of the claims 15 to 21, characterised in that the core network (CN) decides which communication or communications should be handed over to the second access system.

23. The method according to any of the claims 15 to 22, characterised in that all communications which cannot be kept in the second access system are disconnected.

24. The method according to any of the claims 15 to 23, characterised in that at least one decision about a communications which are handed over in the case that the mobile user equipment (MUE) would move between the first access system and the second access system depends on at least one presetting.

25. The method according to claim 24, characterised in that the presettings are located within a mobile user equipment.

26. The method according to claim 25, characterised in that the presettings are transferred to the core network within an initial user equipment (IUE) message and/or in a setup (SU) message.

27. The method according to claim 25, characterised in that a message which depends on the presettings is sent to the core network (CN) after the core network (CN) has sent a request to the mobile user equipment (MUE).

28. The method according to claim 24, characterised in that the presettings are stored within an access network (AN) and/or an core network (CN).

29. The method according to claim 28, characterised in that the presettings can be different for each mobile user.

30. The method according to claim 28, characterised in that the presettings are identical for all users.

31. The method according to any of the claims 24 to 30, characterised in that the presettings can be different for different categories of communications.

32. The method according to any of the claims 24 to 31, characterised in that the presettings can be different for different priorities for different communications.

33. The method according to any of the claims 24 to 32, characterised in that the presettings are defined and/or modified by an operator.

34. The method according to any of the claims 24 to 33, characterised in that the presettings are defined and/or modified by a mobile user.

35. The method according to any of the claims 15 to 34, characterised in that at least one of the communications is put on hold before the handover and kept on hold after the handover.

36. The method according to any of the claims 15 to 35, characterised in that the mobile user equipment (MUE) puts the at least one communication on hold.

37. The method according to any of the claims 15 to 35, characterised in that the core network (CN) puts the at least one communication on hold.

38. Mobile user equipment, capable of communicating in a communication system, characterised in that it contains an indicator that an intersystem handover is needed.

39. Method for managing a communication system, with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment (MUE) and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment (MUE) and the second access system,characterised in that the method is carried out in a way that at least one of the communications is put on hold before the intersystem handover and kept on hold after the intersystem handover.

Summary:

The invention relates to a communication system with at least two different access systems, wherein a first access system is capable of handling a first number of communications between a mobile user equipment (MUE) and the first access system and wherein a second access system is capable of handling a second number of communications between the mobile user equipment (MUE) and the second access system.

According to the invention the communication system contains at least one means for making at least one decision, which communication or communications are handed over in the case that the mobile user equipment (MUE) moves between the first access system and the second access system and at least one means for executing the at least one decision.

The invention further relates to a method for managing a communication system.

Figure 1

List of reference signs:

ACK	acknowledge signal
AN	access network
BSC	base station controller
BTS	base transceiver station
CA	capability answer
CAE	capability analysis element
CCM	clear command
CCP	clear complete signal
CN	core network
CRQ	capability request
DPH	device for deciding if a intersystem handover is performed
DCO	disconnect order
EE	execution element
GSM	Global System for Mobile Communication
HAC	handover access
HCM	handover command
HCP	handover complete signal
HDT	handover detached signal
HO	hold order
HOA	hold acceptance
HQ	handover query
HRE	handover request
HREA	handover request acceptance
HRP	handover response
HRQ	handover required
ICK	communication system information
ISDN	Integrated Service Digital Network
IUE	initial user equipment
LE	logical element
MCT	measurement control

MRT	measurement report
MSC	Mobile Services Switching Centre
MUE	mobile user equipment
PSTN	Public Switched Telephone Network
RCM	release command
RCP	release complete signal
SMS	Short Messaging Service
SU	setup message
UMTS	Universal Mobile Telecommunication System
UTRAN	Universal Mobile Telecommunication System Terrestrial Radio Access Network

FIG 1

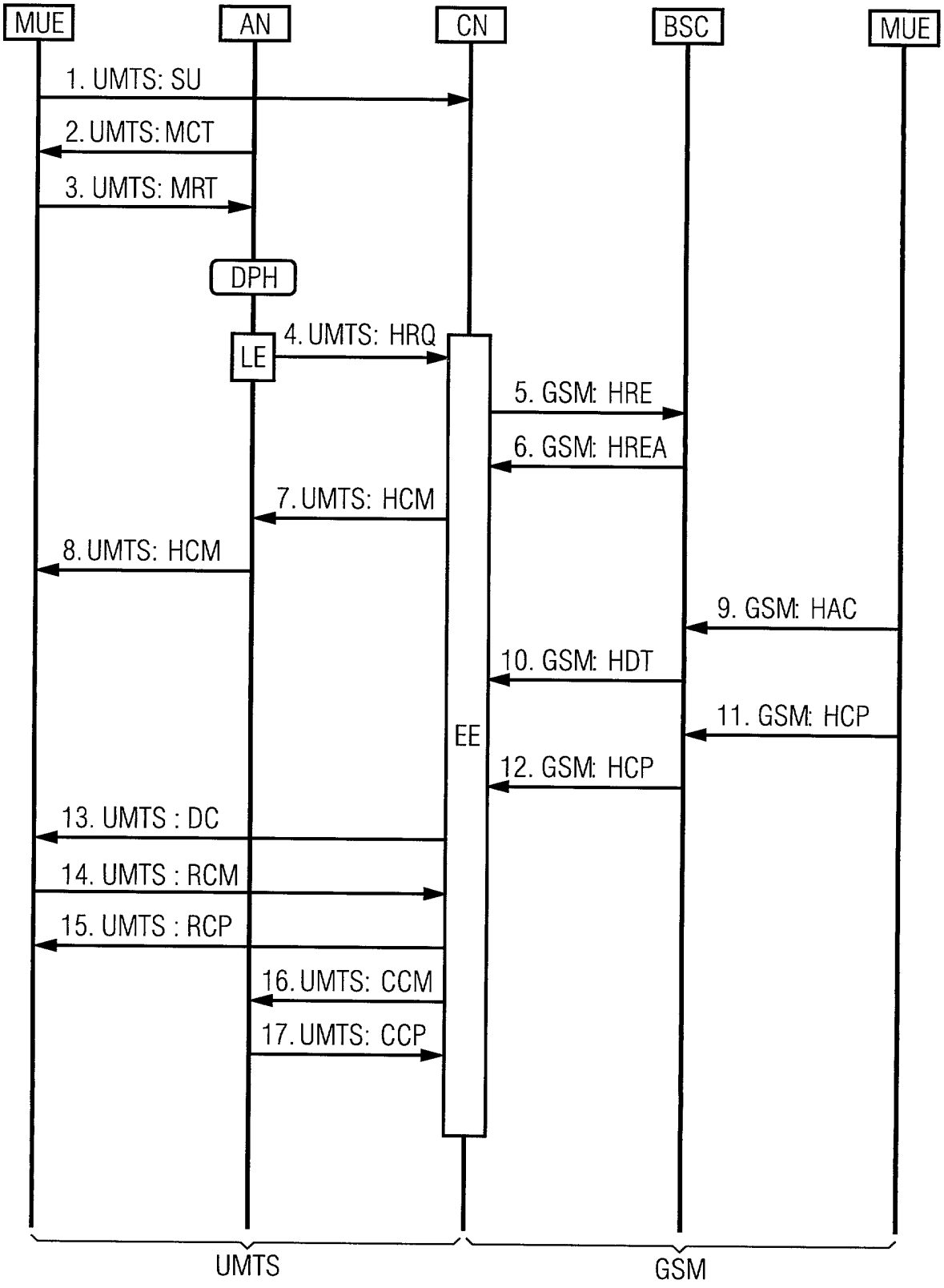

MUE
AN
CN
BSC
MUE
1. UMTS: SU
2. UMTS: MCT
3. UMTS: MRT
DPH
LE
4. UMTS: HRQ
5. GSM: HRE
6. GSM: HREA
7. UMTS: HCM
8. UMTS: HCM
9. GSM: HAC
10. GSM: HDT
11. GSM: HCP
12. GSM: HCP
EE
13. UMTS : DC
14. UMTS : RCM
15. UMTS : RCP
16. UMTS: CCM
17. UMTS: CCP
UMTS
GSM

FIG 2

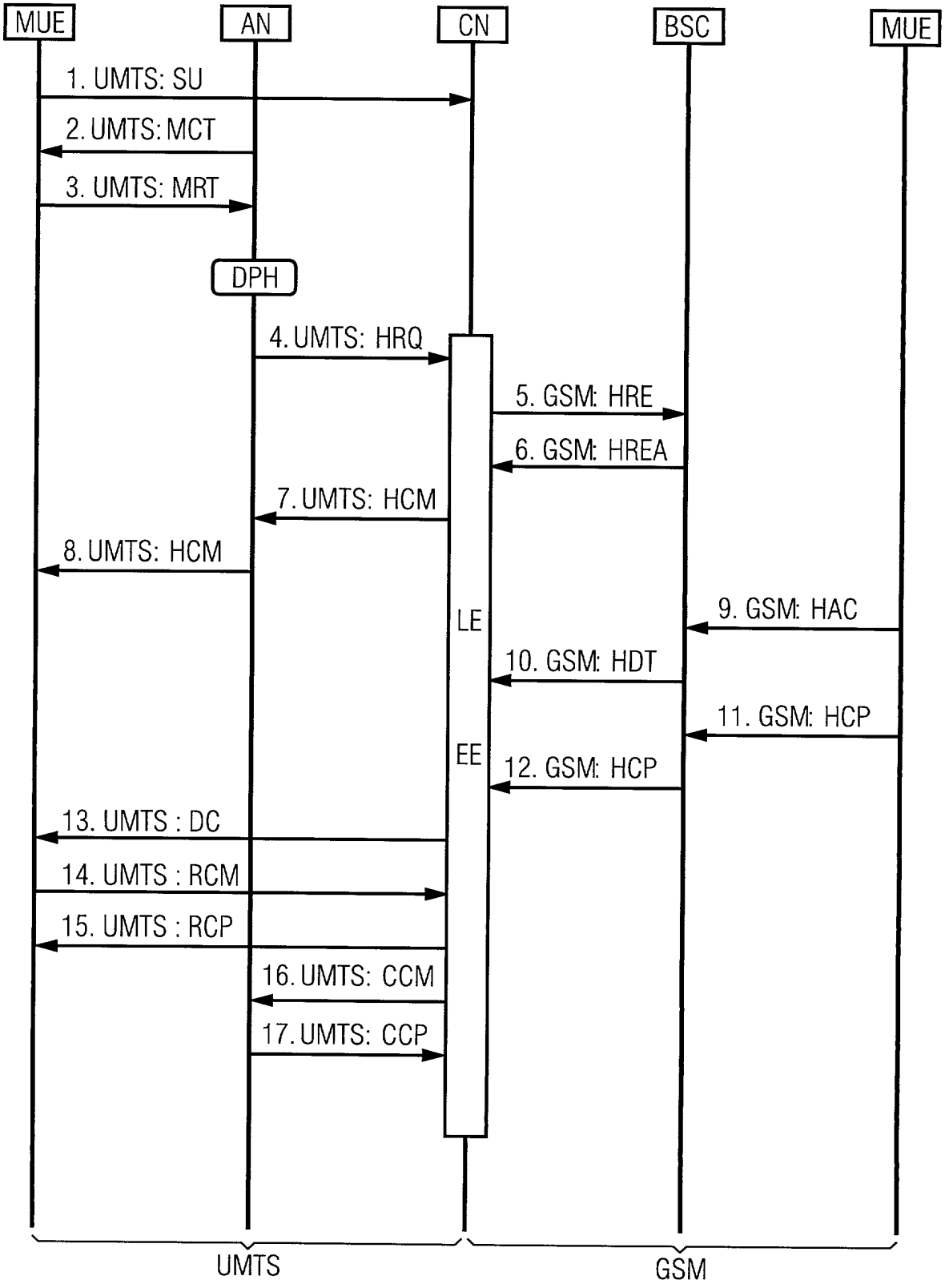

MUE
AN
CN
BSC
MUE
1. UMTS: SU
2. UMTS: MCT
3. UMTS: MRT
DPH
4. UMTS: HRQ
5. GSM: HRE
6. GSM: HREA
7. UMTS: HCM
8. UMTS: HCM
LE
9. GSM: HAC
10. GSM: HDT
11. GSM: HCP
EE
12. GSM: HCP
13. UMTS : DC
14. UMTS : RCM
15. UMTS : RCP
16. UMTS: CCM
17. UMTS: CCP
UMTS
GSM

FIG 3

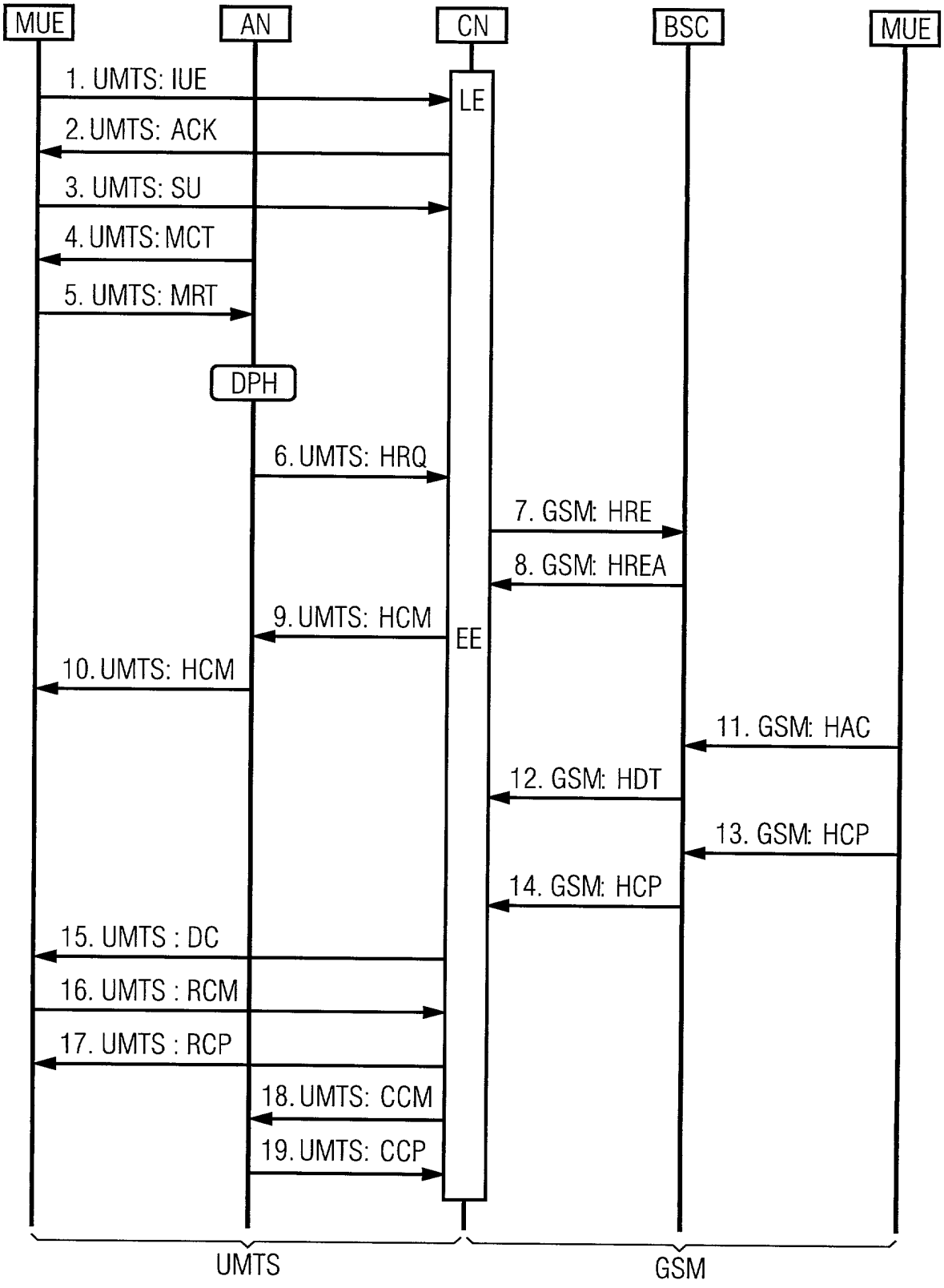

MUE
AN
CN
BSC
MUE
1. UMTS: IUE
LE
2. UMTS: ACK
3. UMTS: SU
4. UMTS: MCT
5. UMTS: MRT
DPH
6. UMTS: HRQ
7. GSM: HRE
8. GSM: HREA
9. UMTS: HCM
EE
10. UMTS: HCM
11. GSM: HAC
12. GSM: HDT
13. GSM: HCP
14. GSM: HCP
15. UMTS : DC
16. UMTS : RCM
17. UMTS : RCP
18. UMTS: CCM
19. UMTS: CCP
UMTS
GSM

FIG 4

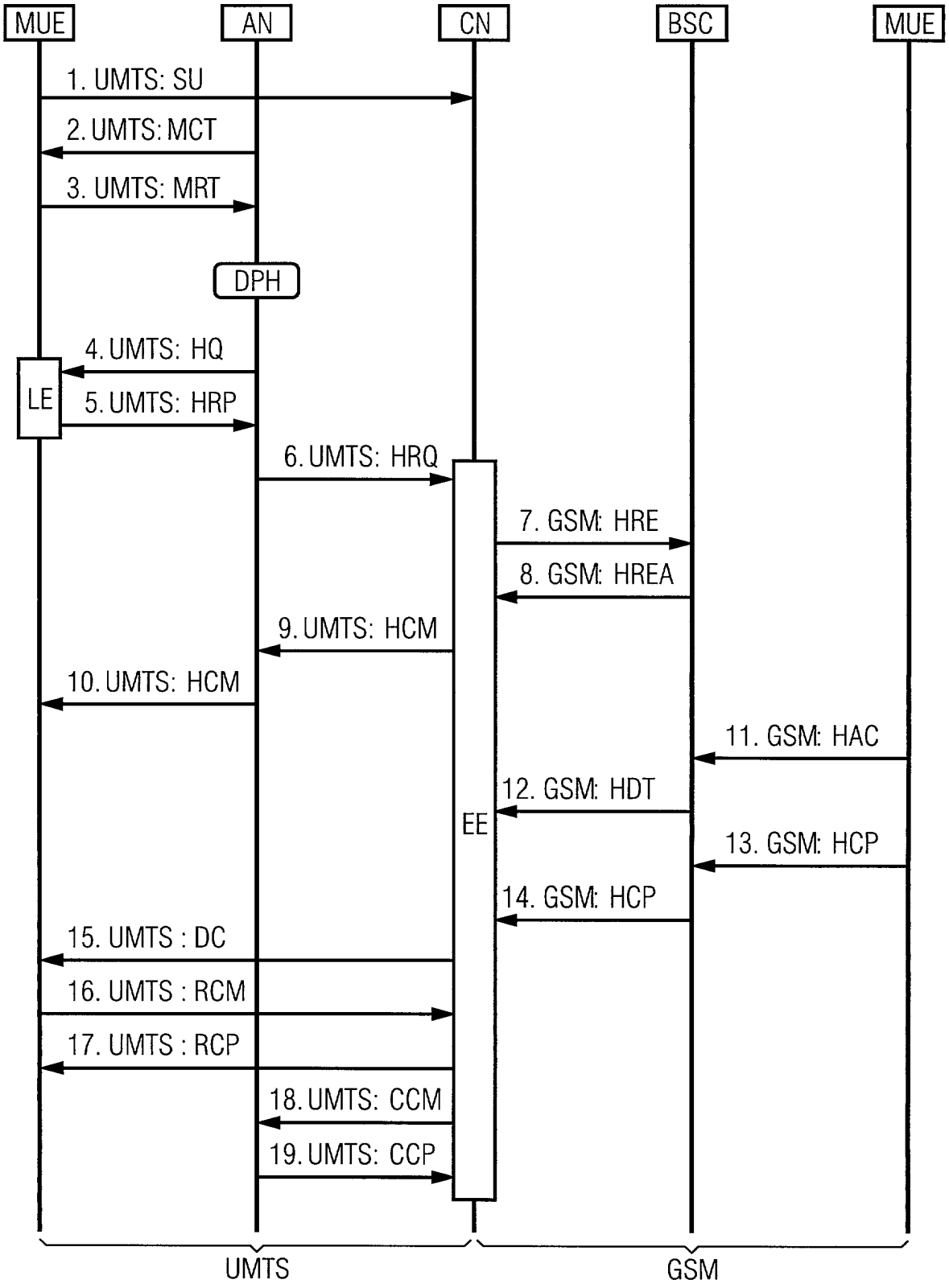

MUE
AN
CN
BSC
MUE
1. UMTS: SU
2. UMTS: MCT
3. UMTS: MRT
DPH
4. UMTS: HQ
LE
5. UMTS: HRP
6. UMTS: HRQ
7. GSM: HRE
8. GSM: HREA
9. UMTS: HCM
10. UMTS: HCM
11. GSM: HAC
12. GSM: HDT
EE
13. GSM: HCP
14. GSM: HCP
15. UMTS : DC
16. UMTS : RCM
17. UMTS : RCP
18. UMTS: CCM
19. UMTS: CCP
UMTS
GSM

FIG 5

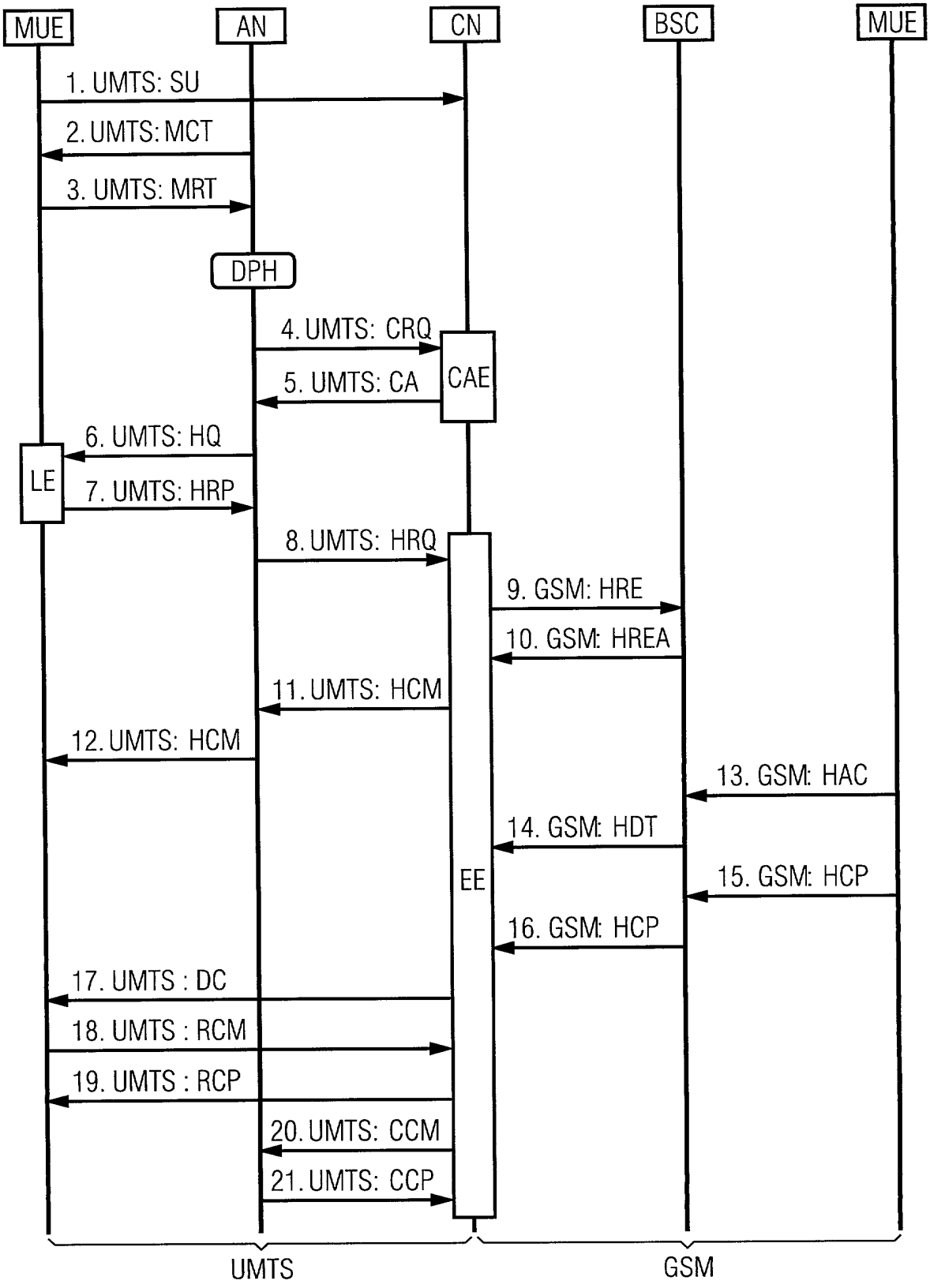

MUE
AN
CN
BSC
MUE
1. UMTS: SU
2. UMTS: MCT
3. UMTS: MRT
DPH
4. UMTS: CRQ
5. UMTS: CA
CAE
6. UMTS: HQ
LE
7. UMTS: HRP
8. UMTS: HRQ
9. GSM: HRE
10. GSM: HREA
11. UMTS: HCM
12. UMTS: HCM
13. GSM: HAC
14. GSM: HDT
EE
15. GSM: HCP
16. GSM: HCP
17. UMTS : DC
18. UMTS : RCM
19. UMTS : RCP
20. UMTS: CCM
21. UMTS: CCP
UMTS
GSM

FIG 6

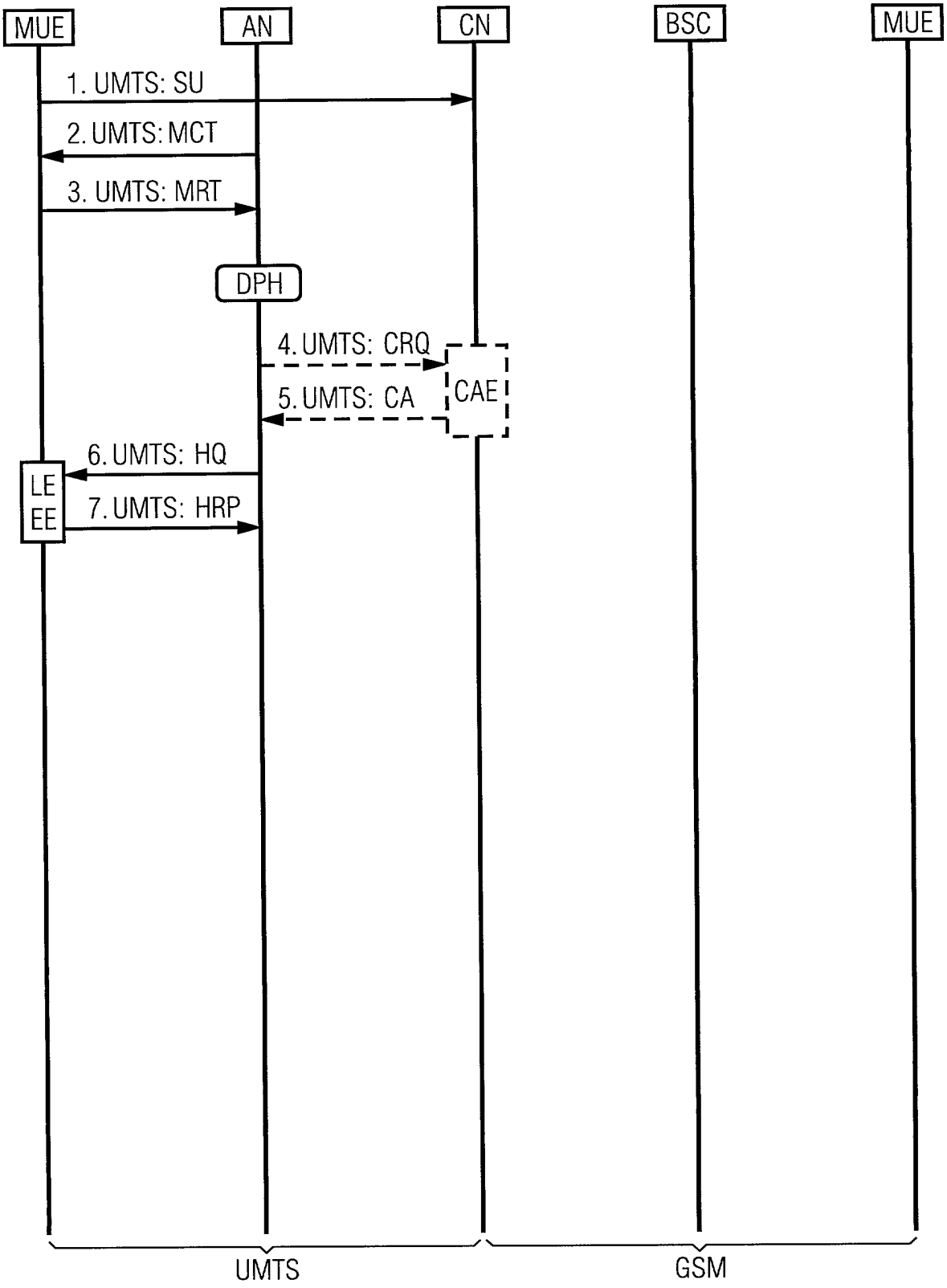
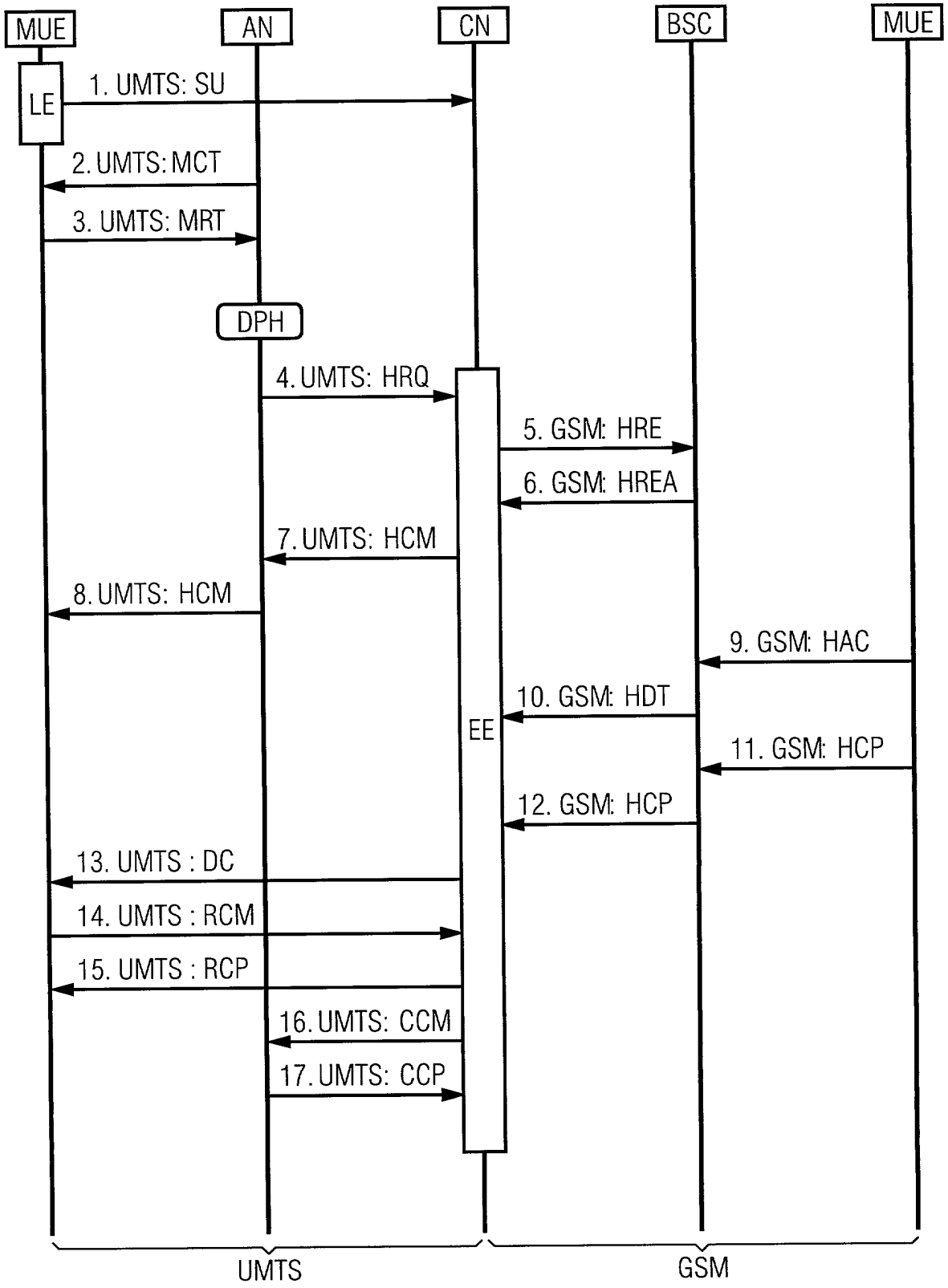

MUE
AN
CN
BSC
MUE
1. UMTS: SU
2. UMTS: MCT
3. UMTS: MRT
DPH
4. UMTS: CRQ
5. UMTS: CA
CAE
6. UMTS: HQ
LE
EE
7. UMTS: HRP
UMTS
GSM

FIG 7


MUE
AN
CN
BSC
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3. UMTS: MRT
DPH
4. UMTS: HRQ
5. GSM: HRE
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8. UMTS: HCM
9. GSM: HAC
10. GSM: HDT
EE
11. GSM: HCP
12. GSM: HCP
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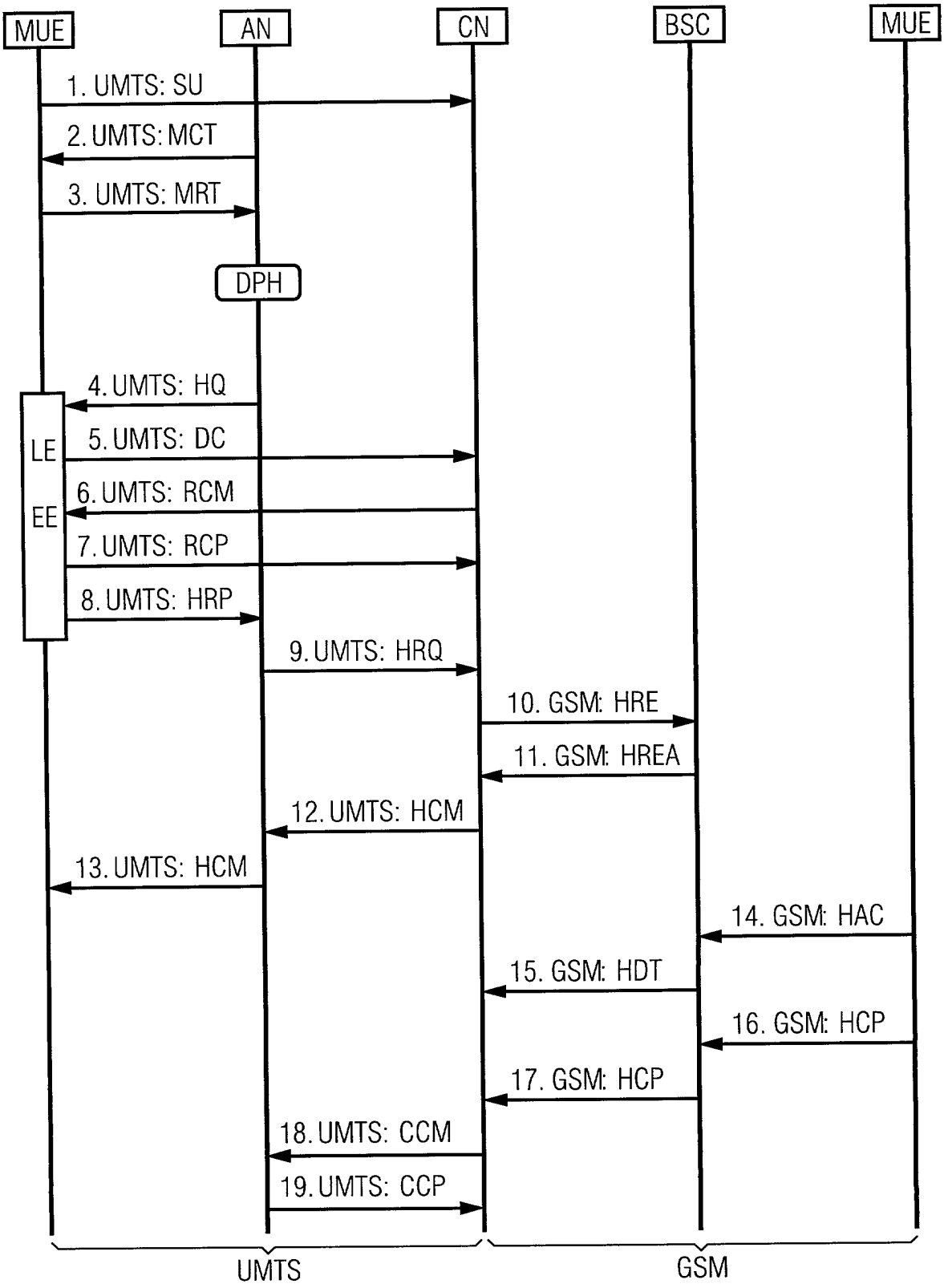
15. UMTS : RCP
16. UMTS: CCM
17. UMTS: CCP
UMTS
GSM

FIG 8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7. UMTS: RCP
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11. GSM: HREA
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13. UMTS: HCM
14. GSM: HAC
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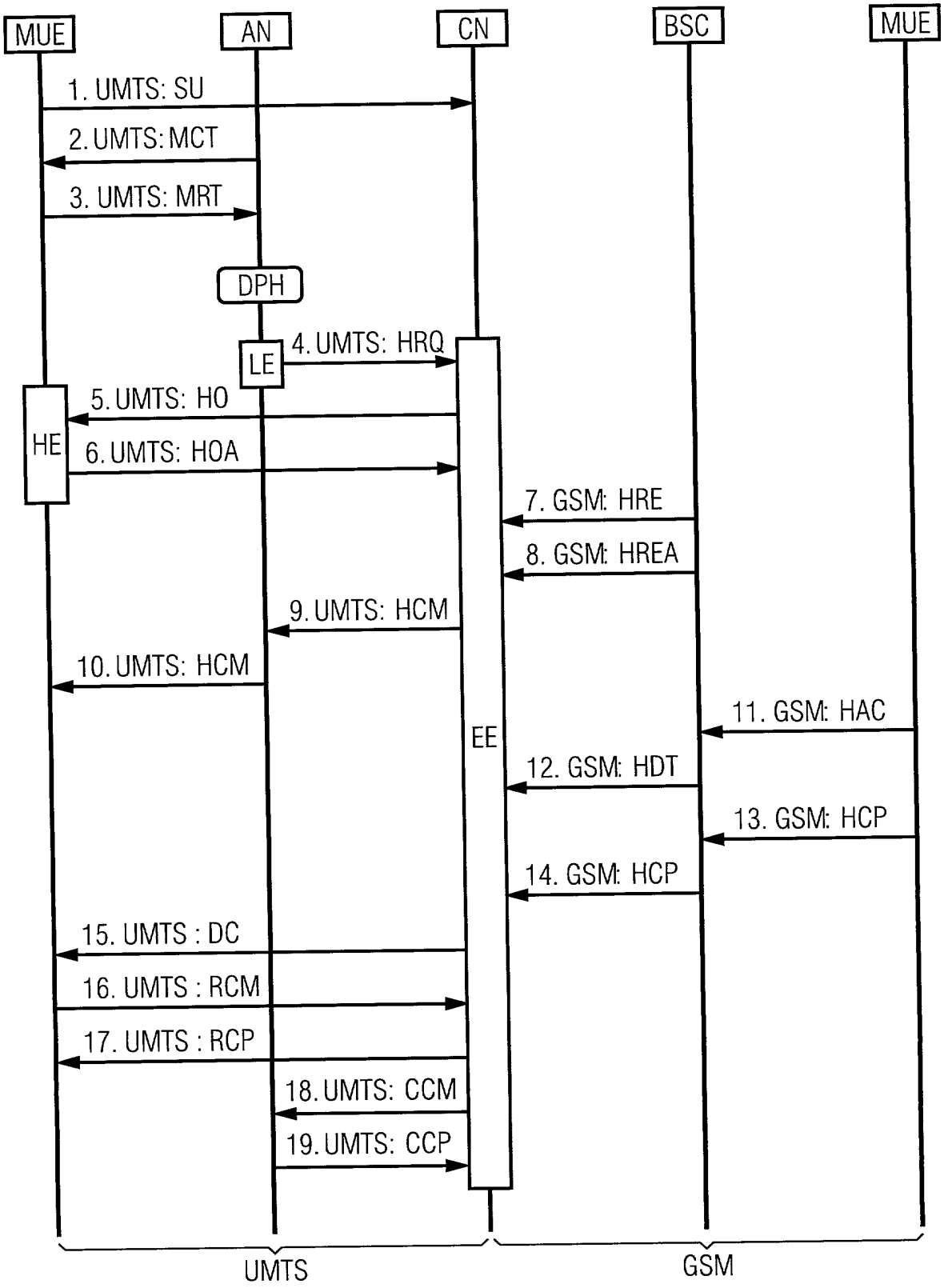
17. GSM: HCP
18. UMTS: CCM
19. UMTS: CCP
UMTS
GSM

FIG 9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10. UMTS: HCM
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11. GSM: HAC
12. GSM: HDT
13. GSM: HCP
14. GSM: HCP
15. UMTS : DC
16. UMTS : RCM
17. UMTS : RCP
18. UMTS: CCM
19. UMTS: CCP
UMTS
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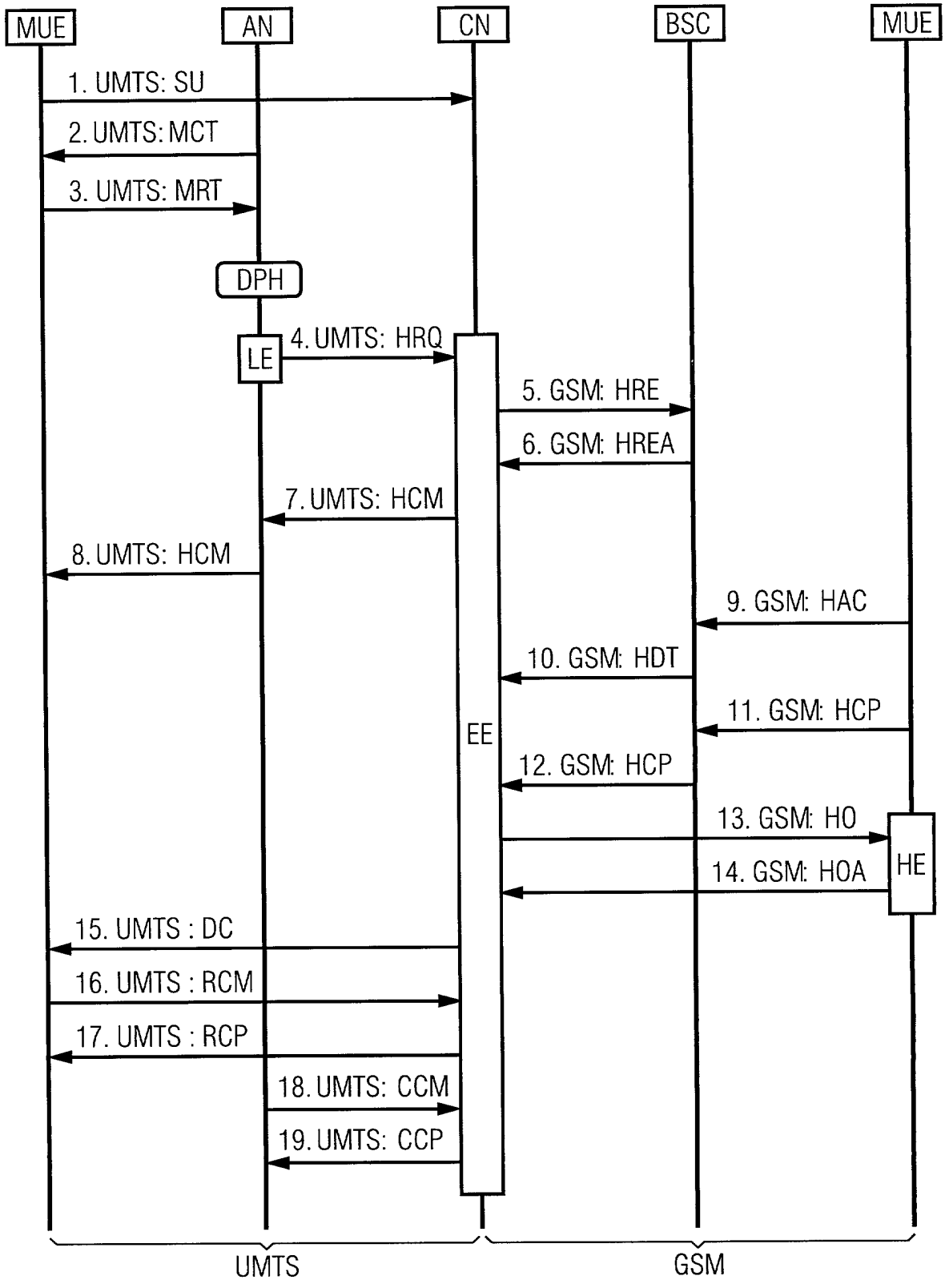
FIG 10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7. UMTS: HCM
8. UMTS: HCM
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10. GSM: HDT
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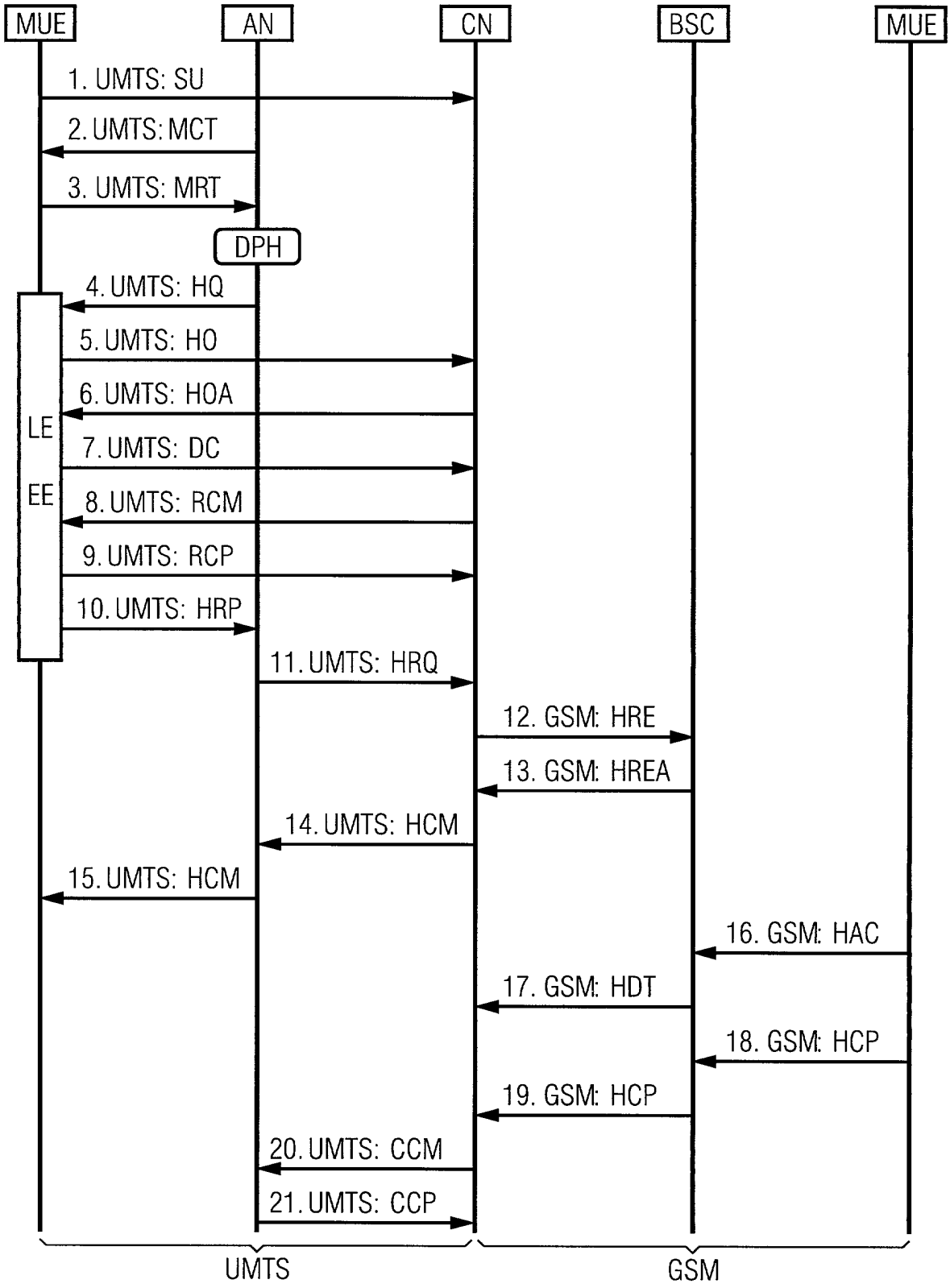
15. UMTS : DC
16. UMTS : RCM
17. UMTS : RCP
18. UMTS: CCM
19. UMTS: CCP
UMTS
GSM

FIG 11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17. GSM: HDT
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19. GSM: HCP
20. UMTS: CCM
21. UMTS: CCP
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GSM

PATENT APPLICATION
DOCKET NO.: 34648/00430USPX
P11303US

RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)
DECLARATION AND POWER OF ATTORNEY

FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **Communication System, Methods of Managing a Communication System and Mobile User Equipment**, the specification of which: (mark only one)

_X_	(a)	is attached hereto.
____	(b)	was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable)
____	(c)	was filed as PCT International Application No. PCT/_____ on ____ and was amended on _____ (if applicable).
____	(d)	was filed on ___ as Application Serial No. ___ and was issued a Notice of Allowance on ____.
____	(e)	was filed on ___ and bearing attorney docket number ____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application

on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

Number	Country	Month/Day/Year Filed	Date first laid-open or Published	Date patented or Granted	Priority Claimed Yes	No
99101948.0	EPO	01/31/99			X	

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

Application No. (series code/serial no.)	Month/Day/Year Filed	Status(pending, abandoned, patented)

NONE

I hereby appoint:

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214/855-4300 (fax)

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(FOR ADDITIONAL INVENTORS, check here _X_ and add additional sheet for inventor information regarding signature, name, date, citizenship, residence and address)

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